



Focus on food allergens

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The prevalence of food allergy has received much interest over the past few years, with an estimated 2-4% of adults and 6% of children now suffering from some type of food allergy. Despite knowing more than ever about the issues surrounding food allergies and the foods that may cause them, food allergies remain a complex and challenging matter.

What causes food allergies?

The immune system protects the body from harmful foreign proteins by generating a response to eliminate them. Allergy is essentially «immunity gone wrong» where a normally harmless substance is perceived as a threat - an allergen - and attacked by the body's immunological defences. In a true allergic reaction, the immune system responds by producing antibodies (proteins that specifically bind to the allergen to deactivate and remove it from the body). Different types of antibodies exist, but the one responsible for causing an allergic reaction to food is known as IgE (Immunoglobulin E). The IgE antibody attaches itself to the allergens, triggering an allergic response.

During an allergic reaction, IgE provokes the release of signalling molecules into the bloodstream, which ultimately prompts the onset of symptoms common to food allergies. These may include skin rashes, itchy nose and eyes, sneezing, wheezing, coughing, itchy lips and mouth, nausea, cramp, bloating, vomiting and diarrhoea. Fortunately, most allergic reactions to food are relatively mild but in very rare cases allergic reactions can be fatal.

Allergy or Intolerance?

Many people call any unpleasant reaction to food an allergy, or an allergic response, but in many cases it is just as likely to be an intolerance or even an aversion. True allergic reactions happen soon after eating, and involve the immune system, with the release of IgE. The symptoms of food intolerance usually take longer to develop, do not involve an immune response, and tend to manifest as bloat, diarrhoea or constipation. An example of food intolerance is lactose intolerance, in which certain individuals lack the digestive enzyme lactase, which breaks down the milk sugar lactose. The lactose is then fermented by the bacteria in the gut, producing flatulence, pain and diarrhoea.

Most common food allergens

All foods have the potential to cause a food allergy, however, in Europe 14 food allergens appear to present the most food allergy risk (Table 1) and are therefore subject to labelling legislation. Of note, children generally grow out of most food allergies during infancy.

Table 1 Major food allergens¹

Celery
Cereals containing gluten
Eggs
Fish
Lupin (a kind of legume of the Fabaceae family)
Milk
Molluscs
Mustard
Peanuts
Sesame seeds
Shellfish
Soya
Sulphur dioxide (used as antioxidant and preservative, e.g. in dried fruits, wine, processed potatoes)
Tree nuts

Threshold values

Of the 2-4% of adults and the 6% of children that suffer from food allergies, there is a high degree of variability as to how much allergen needs to be present in a food to trigger an allergic reaction. The minimum allergen concentration triggering an allergic reaction is known as the threshold. Due to the large differences in threshold values between individuals, it is currently very difficult to identify a universal figure for the maximum concentration of an allergen within a food, which if ingested would not cause an adverse effect. Developing good predictors of reaction severity in individuals is a major research target to address this issue.

European Union (EU) legislation

Currently, there is no cure for food allergy, with the only option available being avoidance by affected patients of the food containing the allergens. To ensure the right level of information is available, the European Commission (EC) has directed that the major 14 potential food allergens (see Table 1) must be clearly shown on the label of all pre-packed foods when they, or any ingredients made from them are used at any level (except for sulphur dioxide, which does not need to be declared at concentrations below 10 mg/kg).

The case of “May contain”

Care is taken during the manufacture of processed foods to prevent cross-contamination of one food product with food allergens from another through good practices in segregation and hygiene. There may however be a chance that a product, which for example does not intentionally include nuts in

the recipe, but is being produced on the same premises as a product that does contain nuts, eventually contains traces of nuts and therefore nut allergens.

In most cases, the likelihood of such cross contact is referred to voluntarily under the caption 'May contain' on pack. This then serves as important information to consumers.

Further information:

[Food allergy and food intolerance backgrounder](#)

References

1. [Commission Directive 2007/68/EC of 27th November 2007](#)
2. [European Commission Joint Research Centre, the Institute for Reference Materials and Measurements section](#)
3. [European Food Safety Authority, News and Press Room section](#)
4. [Food Standards Agency, Guidance on Allergen Management and Consumer Information, Multimedia section](#)
5. [Protall, Food allergens of plant origin - the relationship between allergenic potential and biological activity, infosheet section](#)